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# Design Innovation: Experimental Creative Research Approaches

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**Abstract:** Design innovation is a way of structuring design research processes and practices in pursuit of valuable outcomes. Drawing together ideas of complexity theory, creative action and communities of practice, we depict design research as creative action – an emergent, unpredictable, creative interaction amongst embodied participants and reified objects. From complexity theory we are interested in how modes of interaction and connection, combined with non-linear feedback processes, can give rise to innovation. In particular, we wish to explore how use of visual artefacts and the design of spatial and temporal dimensions of research might influence outcomes. We are attentive to the body as an expressive process rather than simply an instrument of the intellect and are cognisant that design research, like any other social practice, is linked to the processes of identity construction, which is inherently tentative, temporal and temporary in nature.

**Key words:** *Artefact, Design, Innovation, Design Research, Creative Action, Visual*

## 1. Introduction

The aim of the paper is to present a research framework for design research as creative practice. In particular the paper takes a look at the relationship between research and the role of the visual artefact. The work is informed by a combination of ideas based on three orientations. Firstly, organisation as a complex process that increasingly lies beyond the theoretical reach of traditional perspectives. Secondly, in contrast with prevailing views of human action as rational problem-solving or cultural performance, action needs to be treated as a phenomenon that is inherently creative. Thirdly, creative action in complex social settings is primarily about learning and identity construction in communities of practice. We start by laying out the theoretical terrain: complexity, creative action and communities of practice. We then move on to the role of the artefact and design research as creative practice and the implications of our research approach, before presenting an illustration from ongoing work entitled *Three Cubed* and concluding with our current thinking on questions that are emerging from the inquiry. In so doing, we are proposing a contemporary approach to design research that has moved from the design of products to design which is embedded in the understanding of social processes as social storytelling, narrative and identity construction. These in turn are aligned with the demands of our times including on the one hand, impact, creativity and responsiveness and on the other, towards new ways of thinking that emphasise innovation as emergent in context-specific ways through non-linear design processes.

## 2. Complexity, Creative Action and Communities of Practice

Complexity theory describes systems that are capable of spontaneously reconfiguring themselves through the repeated application of simple, order generating rules in a process known as self-organisation [9, 16, 18, 27]. Non-linearity, inter-connectedness and positive feedback are key concepts in understanding the nature of these self-organising processes<sup>1</sup>. A familiar term in complexity theory is the edge of chaos, most frequently associated with work in so-called living systems (e.g. organisms, the human body, neural networks, etc.). Goodwin, [12: p.169] claims that “complex, non-linear dynamic systems with rich networks of interacting elements [have a zone which] ... lies between a region of chaotic behavior and one that is frozen, with little spontaneous activity.” Systems on the edge of chaos appear to constantly adapt and self-organise to create configurations that ensure compatibility with the ever-changing environment. Whilst complexity theory has helped develop alternatives to mechanistic approaches and focuses on creativity as emergent, it could be argued that it provides little insight into the nature and role of individual human action.

Hans Joas’s theory of creative action [17] argues for a new theory of human action in which creativity is regarded as its primary facet. He has criticised rationally and normatively oriented concepts of action, instead developing a theory of creative action based on a combination of insights from the traditions of American pragmatism and German philosophical anthropology. In so doing, he questions the validity of approaches that assume a teleological view of intentionality, control of the body and autonomy of the individual. As an alternative to rational and normative views, Joas has devised a theoretical framework which holds: (1) Emerging intention: intention is a continually emerging facet of an ongoing dialogue between means, ends and context; (2) Embodied expression: the body is the source of personal expression and is not necessarily an instrument of the intellect and; (3) Primary sociality: identity is seen as an evolving process in social interactions.

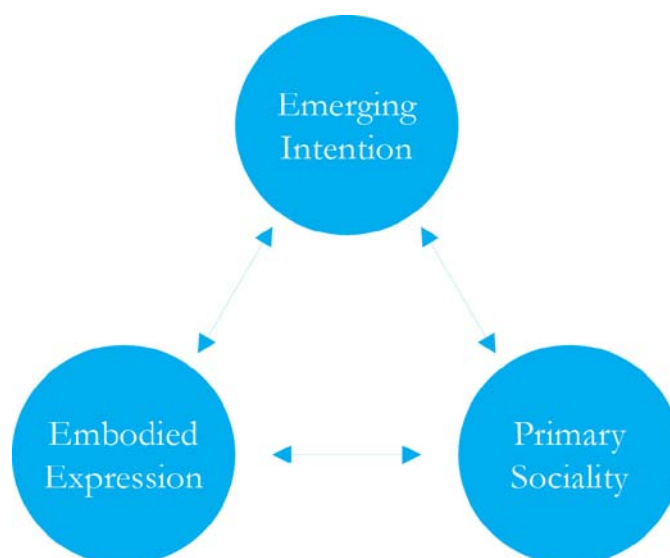


Figure1. Creative Action

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<sup>1</sup>An in-depth description of complexity theory and its origins would be inappropriate here; interested readers can find such descriptions elsewhere (see [34, 8]). Justifications of the use of complexity theory to study organisations have been established [19] and arguments that these concepts might be important to managers can also be found in the literature [2,20].

Whilst most action theories assume instrumental control of the body by the mind, Joas's point is that creative action does not. The body is the source of pre-reflexive feelings and impulses to action. Embodied phenomena such as emotion and intuition are part of pre-reflexivity, which will become emerging intention. Embodied expression situates the body as the location of experience, wellbeing and beauty, which remain marginalised in accounts of individual identity. Incorporation of the individual human body as an expressive medium into theories of organisation in general, and research in particular, is at once a most challenging and promising offering of a theory of creative action.

Joas's primary sociality refutes the notion of an autonomous individual and acknowledges the evolution of identity through social processes. Influenced by the work of the American pragmatists, in particular the social psychology of Mead [22], in which meaning and self continually emerge in networks of gesture and response, Joas's view sits comfortably with versions of social construction theory [6]. Whilst a theory of creative action has ushered in the human body and focused attention away from reified notions of a system in which performances are done to people and towards a view of individual participation and creativity, primary sociality casts little light on how particular qualities of social interactions and practices of collective endeavour lead to outcomes. In a sense, we have gained a connection with individual experience through individual creative practices at the expense of the systems idea of collectivist engagement and observable behaviours in the face of limited resources. Through establishing a link between social processes and the human body, we need to understand more about the roles of specific social situations and contexts characterised by phenomena such as power, meaning and practice. For this we turn to the concept of community of practice.

Wenger's communities of practice is described as a social theory of learning [35]. By the term practice, Wenger means the combination of things people do together to organise both productive and meaningful participation in shared experiences. Practices include developing and using tools, interacting, theorising, and so forth that a community of people have accumulated historically, developed and used in their daily enactments. Wenger points to three key aspects of practice: the negotiation of meaning; the sustaining of community; and learning. Similar to Joas's position, Wenger argues that the fundamental characteristic of practice is how we negotiate meaning in our social lives. It involves two processes; participation and reification. Participation relates to the direct experience of the human body in social networks engaging in practices, such as performing, playing, persuading and so on. Reification relates to abilities and tendencies to conceptualise and disembody particular experiences as a form of social shortcutting, whereby words denote particular experiences, concepts convey ideas, plans communicate intentions etc.



Figure 2. Participation/Reification

Participation and reification are not opposites, but complementary aspects of a duality through which we negotiate meaning. Participation requires using reified objects and reification is meaningless without participation. Wenger points to three key aspects of a coherent community: mutual engagement - whereby individuals have opportunity and cause to engage with one another; shared repertoire of the community's accumulated reified objects – its history as a set of tools, memories, aspirations; and a joint enterprise that invites members to engage and draw on the shared repertoire. Here Wenger draws attention to the concept of trajectory and the duality of continuity and discontinuity in creating a sense of movement from past to future in the present. In particular he highlights the role of the politics of reification and the politics of participation in shaping the dynamics of emergent change. Of particular interest in this paper, communities of practice emphasises the duality between participation and reification in the politically nuanced negotiation of meaning.

### 3. The Role of the Artefact in Design Research

As design researchers, we are particularly interested in the subcategory of reified products as artefacts that are primarily visual in nature and the role they play in research. These roles may vary from visual methods to highly developed visual research outcomes. The last two decades have seen an increasing recognition of the role of the visual within design research. This approach can be traced back to Christopher Frayling's 1993 paper *Research in Art and Design* [11]; three possible lines of inquiry are set out, two of which might be said to necessarily incorporate visual methods or outcomes. Frayling is however highly skeptical of the notion of an artefact being the sole outcome of a research inquiry [11: p.5]. Writing two years later, Bruce Archer is more generous on this issue, stating that there are: "circumstances where the best or only way to shed light on a proposition, a principle, a material or a function is to attempt to construct something, or to enact something calculated to explore, embody or test it" [3: p.11].

It could be argued that contemporary design research and practices, such as human centred design, which involve the construction or making of something as part of the research process, focuses on methodological contribution and the development of theory in relation to user experience<sup>2</sup>. Whilst this is valuable, we contend that the role of the visual has not been fully explored, especially in relation to the theoretical orientation described above. Therefore, our approach is twofold. Firstly, we promote the application of visual methods and techniques within a research process that is self-organising, embodied and necessarily social. Secondly, we seek to extend the legitimacy of research outcomes as reified artefacts that are primarily visual in nature. In both cases design research can be described as creative practice.

### 3.1 Design Research as Creative Practice

Design research as creative practice situates design innovation methodologies as a flexible framework that, consistent with complexity theory, is cognisant of the indeterminate nature of the social situation and its inherent unpredictability. Design research, whilst often successful at describing methodological approaches has not in the main offered cumulative strategies for the heterogeneous nature of creative action. The design research approach as creative practice views research as a set of experimental and emergent practices that can broaden the ways we understand phenomena, expand and facilitate how information is gathered, and advance new ways of seeing data towards developing theoretical constructs. Design research as creative practice offers a framework for interdisciplinary research and in so doing, seeks to develop fora whereby the artefact, as part of the participation-reification dynamic, is treated as a legitimate form of research presentation.

In design research contexts, the artefact often embodies the research inquiry, the questions and the realms of possibilities. The artefact situates the imaginative and intellectual processes, which describe ways of creativity and visual comprehension, as a cognitive coalescence of discourse between, with and around the research situation [33]. It is this precise relationship between research and practice that can reveal deep insights. The production of the artefact in social research contexts represents a repository of data: descriptive, philosophical and theoretical. This approach locates the dialectic connection in design research that involves an examination between ideas, reflection and creative action. The inductive process involves observing phenomena and gathering rich data in order to describe an ongoing process of experimental and emergent inquiry. The rich mix of personal, socio-cultural and contextual influences aligned to the use of diverse research methods, provides the basis for documenting and producing visual schema.

Design research contexts acknowledge the multiplicity of roles researchers play in inquiries. Equally, the researchers and the interventions are designed in relation to the participation-reification dynamic central to creating communities of practice. Communities of practice locate the role of the researcher within a wider frame of reference. The researcher functions as a mediator of visual and verbal discourses. Together the dynamic play of the image, object and text act as significant symbols pertaining to the materials the researchers employ as creative catalysts at work. Not only can these be visually read but the social context, in which they are produced, presented

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<sup>2</sup> Beyond this outline, a full elaboration of contemporary theoretical movements within design is beyond the scope of this paper. A useful mapping of contemporary methodological directions in design research is available elsewhere (see [19]).

and consumed, influences the kinds of meanings that are made. This approach advocates a spirit of inquiry between the artefact and the research, which not only situates the work in its social and cultural situation, but allows the future investigation and dissemination of ideas that underpin the interpretation and meanings of visual communication to span the paradigmatic divide between research and visual practice and dichotomies, such as: theory-practice; intellectual-emotional; abstract-embodied.

### **3.2 Research Approach**

Having outlined our theoretical position, the role of the artefact and design research as creative practice, we now present our research approach entitled Three Cubed. Three Cubed comes from the word cubed or the power of three. The approach involves three people working together in stages of three days, for three times, that is,  $3^3$ . The cube is an agile method of design research within a thematic territory. A cube is an intervention that is designed to create trajectories or tangible outcomes within large territories, whilst allowing for an open approach to the research process. An interdisciplinary team of three people from the domain of design or wider disciplines undertake a project within a defined research theme and work for nine days each, totaling 27 person-days, to deliver propositions including high quality visual assets. The rhythm of the work is self-organised by the cube, along with the organisation of the project, the roles and methods.

Within our initial framing of the cube model there are two types of cube: academic and impact, each focusing on different outcomes. Following a pre-orientation phase where the team is focused on the thematic territory it is envisioned that the cubes will undergo three iterations of inductive development. In the first iteration, orientation, the issue in hand would be researched and the researchers would seek to define a research question. In the second iteration, immersion, the researchers would immerse themselves within the context of the inquiry and seek to develop experiential narratives and artefacts. Finally, in the third iteration, validation, they would seek to validate earlier findings towards deductive testing. In both academic and impact cubes; the purpose is to address a research theme with diverse teams of collaborators working together for short periods. The background knowledge of the researchers and participants is applied and developed quickly within a fast-paced collaborative space. The rhythm of collaboration within and the pacing across cubes is a topic of interest within design research contexts as a community of practice develops. It is anticipated a number of cubes within the same theme will start to generate overlaps, spin-offs and sub-themes as a meso-organisation of connections emerge.

# Three Cubed Model

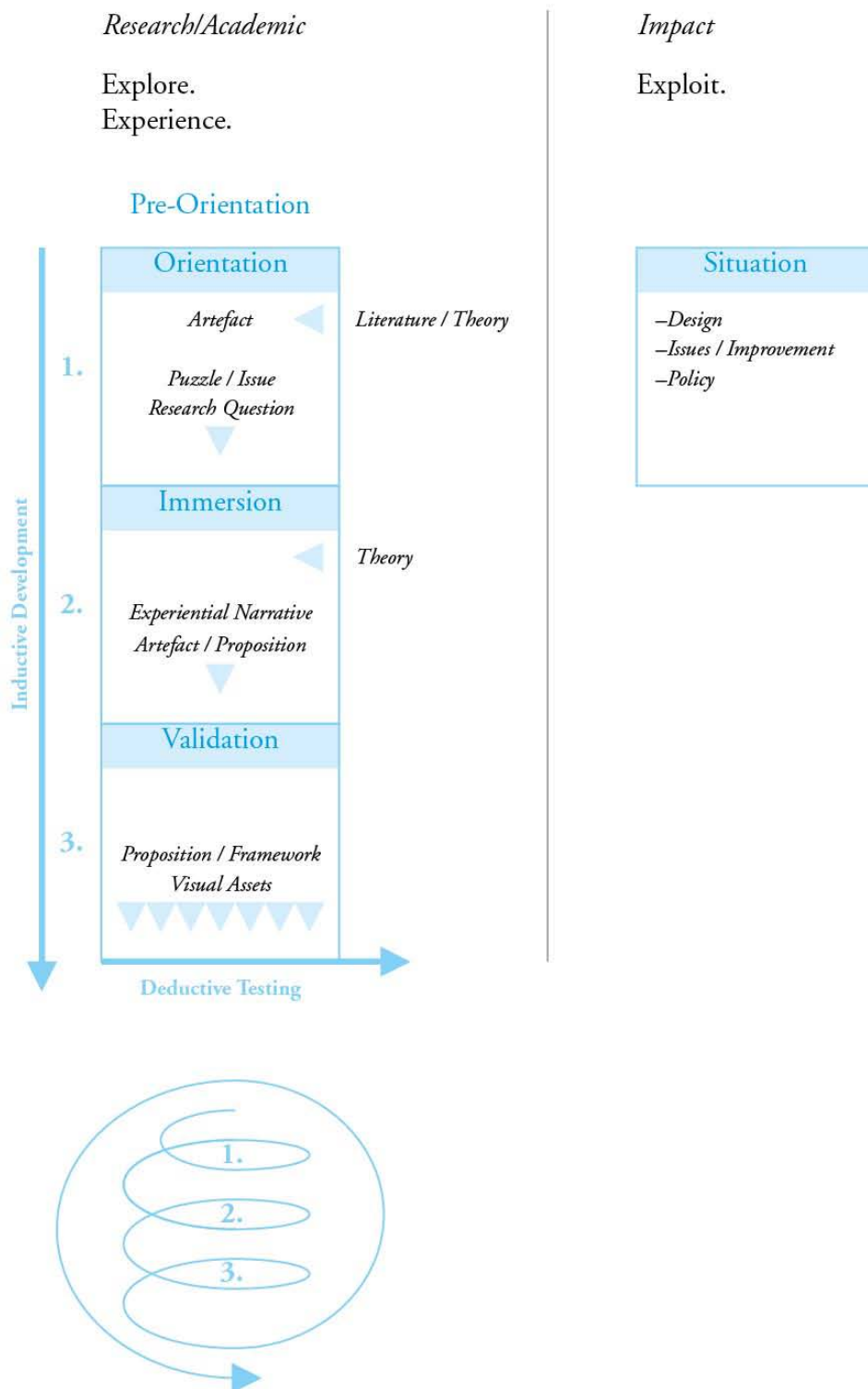


Figure 3. An initial framing of the cube model, showing the two different types of cube (i.e. Academic or Impact) and the expected iteration of each.



### 3.3 Research Context and Setting

The dialogical process aims to address site-specific research through a series of themes, the first of which, explored in this paper, is Distributed City. Distributed City [24] is an imagined city, a metaphor to understand relationships in and beyond a region. The research approach is focused specifically on the levels of collectivity required between the individual and the community. Innovation practices have historically been located and profiled in large-scale contexts such as multinational companies, or located in urban contexts, as demonstrated in Richard Florida's work *The Creative Class* [10]. Florida's work identifies a creative elite largely responsible for the success of the urban creative dynamic. In contrast, the Distributed Cities approach promotes connected communities that favour collective creativity alongside multidisciplinary expertise that is spatially and temporally located. This investigation of networks prioritises links between innovation and intellectual capital that in turn determine the ways in which apparently disparate resources – physical, social and material – can be usefully related through a visual schema to create communities within an ecology of social and cultural activities.

In the specific site of the research situation, the three researchers that constitute the cube are placed definitively within the frame of the research, interacting with the data as it is produced and creating relations with and through it. In this manner, researchers and research participants form a nexus of relations concurrently engaged in the field of study and emanate deeper insights and understandings. It is important to note that this is an ongoing research project. The following description of the pilot cube is drawn from the account of one of the researchers. The initial Cube consisted of three early career researchers with backgrounds in visual communications, set-design and photography. The process commenced with a provocation on the Distributed City theme as outlined above. The explicit requirements detailed that the team should form a production company as a metaphor for a mode of operations which, as an outcome, would produce high-quality multi-platform visual assets. It was intended that these requirements would guide the researchers towards forming an interdisciplinary community of creative practice focused on the production of visual artefacts that would involve the application and mediation of visual discourses. On the one hand, the conditions of participation were configured at the outset whilst on the other, the process of reification along with required outcomes, was deliberately left open. A final presentation and review date was set three months after commencement of the cube.

The team was quick to adapt to the research situation and within the first day they overcame the initial difficulties involved in developing a shared repertoire and reached a common understanding of their preliminary aims. Aligned to complexity theory's premise that systems are capable of spontaneously reconfiguring themselves, the team elected that rather than work remotely they actively engaged in site-specific research for the next phase of the cube. Desk research was then undertaken to sketch possible future trajectories. In the planning of the second phase of the research the team decided that an artefact, in this case a blank map of Scotland, would be deployed both to direct conversations and record findings among a random sample of participants to be recruited during a single day's intervention in selected public spaces in the region. Responding to a series of questions posed by the researchers, participants were requested to use different coloured pens to indicate their networks, connections and perceptions of the region. In total ten maps were drawn by a heterogeneous group of both locals and incomers. Through situated mark-making each map captures a version of participants' relationship with the Distributed City.

In addition, the maps functioned as conversational platforms, where insights regarding networks and perceptions were elicited and recorded. Post-intervention, through the synthesis and interpretive phenomenological analysis of the data a focused discussion circulated around the maps as knowledge-repositories. Following this the team arrived at a common agreement regarding their future approach and organically delegated tasks. Within this delegation of protocols, each member identified their own particular specialism. The final three-day phase was distributed fluidly between the team with members attending to their own individual areas of responsibility, and trading time back as necessary. Time in this case became a currency socially mobilised through need and necessity.



Figure 4. A single participants' map with relating their networks and perceptions.

At the final review in response to the original one-page provocation the team presented three large-format maps, accompanied by a reflexive document and the raw data files. The maps combined the situated mark-making of the regional participants, offering an array of exploratory visualisations that invited interpretation. Highlighting the potential of these visuals, the team outlined a proposition whereby this approach would be scaled to incorporate larger samples of the region's communities. In this iteration, the maps would act as mark-making surfaces and conversational platforms through an articulation of images, networks and connected communities, as a process of reification, which in turn represents the Distributed City.

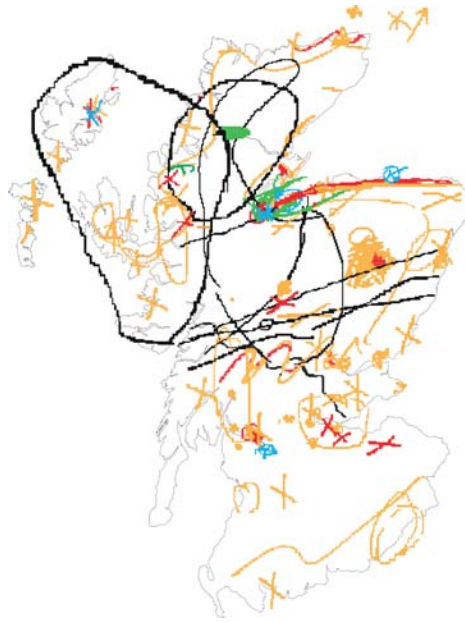


Figure 5. Composite map of Inverness participants' networks and perceptions.

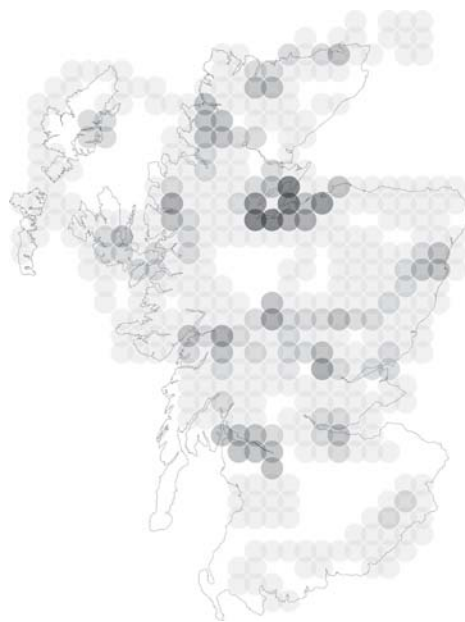


Figure 6. Circles highlighting the density of marks made by Inverness participants.

#### 4. Discussion and Conclusions

Our theoretical positioning, the role of the artefact and depiction of design research as creative practice led to a number of questions and points of interest at this early stage in our inquiry. In particular we are concerned with designing research approaches in innovative ways through sidestepping many of the dichotomies that characterise traditional approaches such as: research-practice, research-researched, thinking-acting and so forth. In so doing we are questioning some of the traditions of research, such as rationally structured, mechanical action geared towards known outcomes and engaging in research trajectories rather than solutions.

What does it mean to engage in research as a complex, situated creative dynamic? At this stage we are concentrating on two key issues which we see as mutually constitutive: (1) creative dynamics and (2) the role of the visual artefact. Starting with creative dynamics, one of the critical issues in developing new ways of researching from a complexity angle is to figure out what to structure and equally, what not to structure [5]. One response to this is to experiment with semi-structures, which are spatially and temporally located and through design practices that pace and patch between them. In some ways, we are working with the idea of research as a choreographed pattern of social-material interactions with distinctive spatial configurations and rhythms. The role of the visual artefact, both as method and outcome, is critical to design innovation research as it allows both researchers and participants, with and through the visual artefact, to create, reflect and critique. In this way, the artefact contributes to the formation of communities of practice. Tracing these formations, we strive to develop a compatible theory of human action, which deals with relationships between social processes, meaning and identity construction and the interactions of private embodied experiences that characterise everyday enactments.

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